Annual WATER QUALITY REPORT

Reporting Year 2011

Presented By
Harrisonburg VA
Public Utilities

PWS ID#: VA2660345

Meeting the Challenge

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2011. Over the years, we have dedicated ourselves to producing drinking water that meets all state and federal standards. We continually strive to adopt new methods for delivering the best quality drinking water to you. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all our water users.

Please share with us your thoughts or concerns about the information in this report. After all, well-informed customers are our best allies.

Source Water Assessment

A Source Water Assessment for the City of Harrisonburg was completed by the Virginia Department of Health on May 24, 2002. This assessment determined that the city's water sources, North River and Dry River, are surface waters exposed to a wide array of changing hydrologic, hydraulic, and atmospheric conditions. More specific information may be obtained by contacting the Harrisonburg Director of Public Utilities, Michael Collins, at (540) 434-9959.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses;

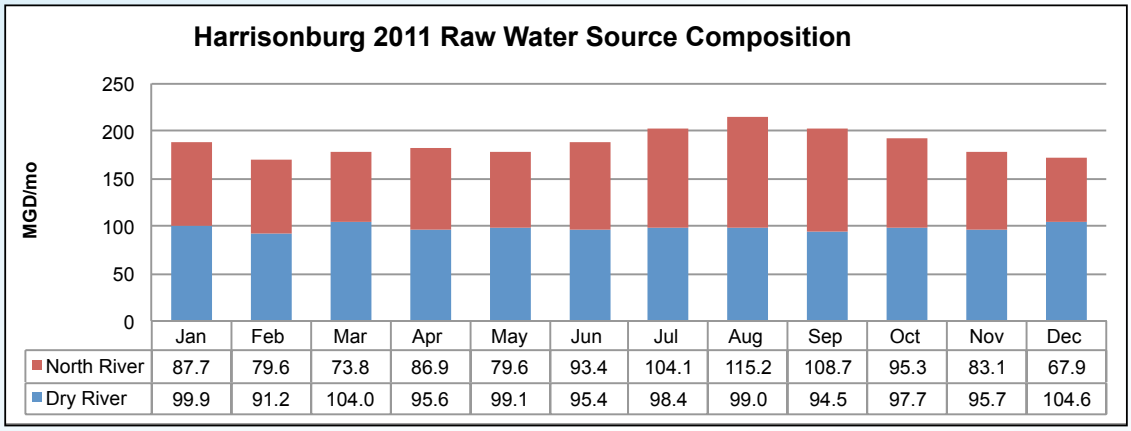
Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Where Does My Water Come From?

The City of Harrisonburg has two reliable water supply sources. The Dry River in Rawley Springs is a surface water source. The watershed includes the Switzer Reservoir Impoundment, which can supply the piping network at capacity with 4 million gallons per day (except during drought) of highest quality water at the most cost-effective price. The North River in Bridgewater is also a surface water source and provides up to 7.5 million gallons per day and 5.5 million gallons per day during drought. The water quantity and quality of the North River fluctuates due to runoff conditions at the withdrawal site. Because our treatment facility has the capacity to provide 15 million gallons of clean drinking water every day, we are in the process of developing a supply line from the South Fork Shenandoah River. (You can find the latest Eastern Raw Waterline Stakeholders Report on our website www.harrisonburgva.gov/public-utilities) Once this project has been completed, we expect to provide a supply of 15 million gallons per day to our customers.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North River	87.7	79.6	73.8	86.9	79.6	93.4	104.1	115.2	108.7	95.3	83.1	67.9
Dry River	99.9	91.2	104.0	95.6	99.1	95.4	98.4	99.0	94.5	97.7	95.7	104.6

The composition of raw water sources for Harrisonburg is shown above. The Dry River source is a soft (approx. 9–15 mg/L) hardness, low pH (approx. 6.2–6.6), pristine quality, and economical (zero electrical cost) water. Considering some needs to overcome lower pH effects, this source is the priority target for the Harrisonburg operations strategy. Annually, the two sources are used about equally; however, the North River source's higher pH (approx. 7.4–8.5) and hardness (approx. 30–150 mg/L) become highly more prominent during July through September. The effects are shown on the pH and hardness information in this report.

Questions?

If you have questions about this report or want additional information about the quality of your drinking water, please contact our Engineering Superintendent, David Gray, at (540) 434-9959. You may see updates of this report on our Web site: www.harrisonburgva.gov/water-quality.

Lead in Home Plumbing

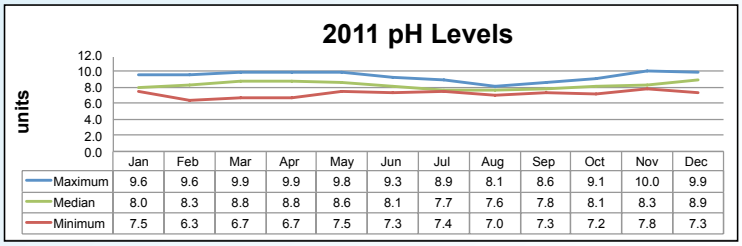
If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

Harrisonburg 2011 pH Levels

The pH of water is an indication of acidity to basic on a scale of 0 to 14. A pH value of 7 means a substance is neutral. The lower value indicates acidity, and a higher value is a sign of alkaline or basic.

So, what does pH mean for water? In general, water with a pH less than 6.5 could be acidic, soft, corrosive and could contain metal ions such as iron, manganese, copper, lead, and zinc. Acidic water can cause premature damage to metal piping and can have aesthetic problems such as a metallic or sour taste. For water with a pH greater than 8.5, efficiency with chlorine disinfection decreases and some by-products increase. However, corrosion protection is inherent with higher pH.

While the ideal pH level of drinking water should be between 6–8.5, the human body maintains pH equilibrium on a constant basis and will not be affected by water consumption. For example, our stomachs have a naturally low pH level of 2, which is a beneficial acidity that helps us with food digestion. To better understand the range in pH, take a look at these examples:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	9.6	9.6	9.9	9.9	9.8	9.3	8.9	8.1	8.6	9.1	10.0	9.9
Median	8.0	8.3	8.8	8.8	8.6	8.1	7.7	7.6	7.8	8.1	8.3	8.9
Minimum	7.5	6.3	6.7	6.7	7.5	7.3	7.4	7.0	7.3	7.2	7.8	7.3

Range 6.3–10.0

Substances	ph
Apple Juice	3.0
Orange Juice	3.5
Coffee	5.5
Milk	6.2
Baking Soda	8.5
Soapy Water	10.0

Harrisonburg 2011 Hardness Levels

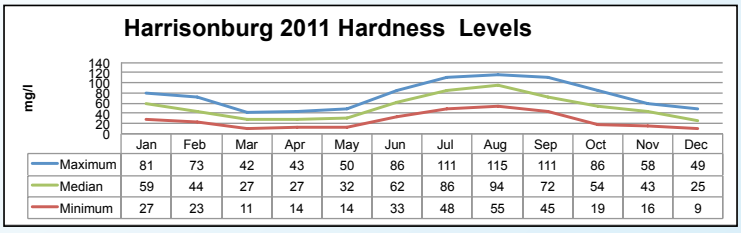
Hardness is due primarily to calcium and magnesium carbonates and bicarbonates (carbonate hardness, which can be removed by heating) and calcium sulfate, calcium chloride, magnesium sulfate, and magnesium chloride (noncarbonated hardness, which cannot be removed by heating). The United States Geological Survey uses the following classification of hard and soft water.

Classification	Hardness in mg/L
Soft	0–60
Moderately Hard	61–120
Hard	121–180
Very Hard	≥181

With hard water, soap solutions form a white precipitate (soap scum) instead of producing lather. Hardness can thus be defined as the soap-consuming capacity of a water sample; however, synthetic detergents do not form such scums. In addition to being objectionable for laundry and other washing purposes, excessive hardness contributes to the deterioration of fabrics. Satisfactory cleansing of laundry, dishes, and utensils is made difficult or impractical.

Hard water also forms deposits that clog plumbing; these deposits are called "scale." The resulting build-up of scale restricts the flow of water in pipes. In boilers, the deposits impair the flow of heat into water, reducing the heating efficiency and allowing the metal boiler components to overheat.

The World Health Organization says that "there does not appear to be any convincing evidence that water hardness causes adverse health effects in humans."



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	81	73	42	43	50	86	111	115	111	86	58	49
Median	59	44	27	27	32	62	86	94	72	54	43	25
Minimum	27	23	11	14	14	33	48	55	45	19	16	9

Range 9–115 mg/l

MARKET ANALYSIS OF WATER AND SEWER RATES AMONG WATER SYSTEMS OF 10,000-30,000 RESIDENTIAL WATER UNITS 5,000 GALLONS WATER AND SEWER CONSUMPTION				
UTILITY PROVIDER	RESIDENTIAL WATER UNITS	WATER $/5000 GAL	SEWER $/5000 GAL	W & S RATE $/5000 GAL
James City Service Authority	18,919	14.25	14.00	28.25
City of Petersburg	10,105	10.68	20.73	31.41
City of Harrisonburg	**12,203**	**12.33**	**24.66**	**36.99**
City of Fairfax	10,181	22.25	21.67	43.92
Spotsylvania County	26,640	23.34	23.07	46.41
City of Portsmouth	29,480	32.94	21.03	53.97
City of Lynchburg	22,000	17.16	39.62	56.78
Frederick Co. Sanitation Auth.	13,007	25.45	31.61	57.06
Town of Leesburg	15,882	25.95	32.25	58.20
Hanover County	18,599	19.56	39.84	59.40
Henry County Public Service Auth	13,126	30.00	30.00	60.00
City of Salem	8,634	26.75	35.00	61.75
Albermarle Co Service Auth.	24,175	29.32	36.05	65.37
City of Charlottesville	13,068	33.19	33.86	67.05
Augusta Co. Service Auth.	15,586	28.22	44.52	72.74
Washington Co Service Auth.	19,313	35.37	56.32	91.69
City of Suffolk	28,382	45.48	53.33	98.81
Virginia Control Group	**N/A**	**25.70**	**32.88**	**58.58**

Courtesy of Draper Aden Associates 2011 Study

HARRISONBURG WATER AND SEWER EXPENSES AND SERVICES PROVIDED				
2010-2011 WATER AND SEWER ITEMIZATION OF EXPENSES	WATER FUND		SEWER FUND	
	COST PER 1000 GALS.	SERVICES PROVIDED	COST PER 1000 GALS.	SERVICES PROVIDED
ADMINISTRATION	$0.21	customer service administrative functions	$0.36	executive services, engineering services,
PUMPS, STORAGE, MONITORING	$0.27	water operations water maintenance	$0.08	sewer operations , sewer maintenance,
TRANSMISSION, COLLECTION, DISTRIBUTION	$0.37	support programs, repairs to water system, assist road paving, water system reliability, water system accountability, water system quality, equipment & vehicles, buildings and grounds, Miss Utility, assist other departments, new water services, construction	$0.50	support programs, repairs to sewer system, assist road paving, sewer system reliability, I&I abatement, equipment & vehicles, buildings and grounds, Miss Utility, assist other departments, new sewer services,construction
UTILITY BILLING	$0.17	utility bills and accounting	$0.17	utility billing field services
MISCELLANEOUS	$0.24	equivalent taxes	$0.20	equivalent taxes
PURIFICATION OR TREATMENT	$0.50	water plant operations water plant maintenance	$1.74	HRRSA operations HRRSA maintenance
TOTAL OPERATING	**$1.76**		**$3.05**	
CAPITAL	$0.16	capital outlay capital repacements capital additions	$0.26	capital outlay capital repacements capital additions
TOTAL DEBT SERVICE	$0.39	raw water project debt storage tank debt	$1.52	HRRSA debt
TOTAL TRANSFERS	$0.43	support general fund	$0.48	support general fund
TOTAL WATER FUND	**$2.74**		**$5.31**	

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2011	2	2	0.037	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Haloacetic Acids [HAA] (ppb)	2011	60	NA	23	11–35	No	By-product of drinking water disinfection
Nitrate (ppm)	2011	10	10	1.59	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2011	80	NA	39	14–75	No	By-product of drinking water disinfection
Total Coliform Bacteria (% positive samples)	2011	5% of monthly samples are positive	0	4	NA	No	Naturally present in the environment
Total Organic Carbon (ppm)	2011	TT	NA	NA	0.44–1.20	No	Naturally present in the environment
Turbidity[1] (NTU)	2011	TT	NA	0.16	0.04–0.16	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2011	<0.3 NTU	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2010	1.3	1.3	0.025	0/40	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2010	15	0	0	0/40	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Fluoride[2] (ppm)	2011	2.0	NA	0.92	ND–1.10	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories

[1] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.
[2] The reported amount detected is the average of all samples in the current year.

Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.